Amendments to the Claims:

Please amend claims 1, 3, 4, 7, 8, 11, and 48-54. Please cancel claims 2, 6, 43-47, and 56-62 without prejudice or disclaimer. Please add new claims 63-72. Please note that all claims currently pending and under consideration in the above-referenced application are shown below. Please enter these claims as amended. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A G-protein fusion receptor comprising:

a) an extracellular domain comprising an extracellular domain amino acid sequence ~~at least 75% identical to either an extracellular calcium receptor ("CaR") amino acid sequence, an extracellular metabotropic glutamate receptor ("mGluR") amino acid sequence, or an extracellular γ aminobutyric acid receptor ("$GABA_BR$") amino acid sequence~~ selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, and SEQ ID NO: 5, wherein said extracellular domain is capable of binding a native CaR, mGluR, or $GABA_BR$ ligand;

b) a transmembrane domain joined to the carboxy terminus of said extracellular domain, said transmembrane domain comprising a transmembrane domain amino acid sequence ~~at least 75% identical to either a transmembrane CaR amino acid sequence, a transmembrane mGluR amino acid sequence, or a transmembrane $GABA_BR$ amino acid sequence~~ selected from the group consisting of SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, and SEQ ID NO: 10;

c) an intracellular domain joined to the carboxy terminus of said transmembrane domain, said intracellular domain comprising all or a portion of an intracellular amino acid sequence ~~at least 75% identical to either an intracellular CaR amino acid sequence, an intracellular mGluR amino acid sequence, or an intracellular $GABA_BR$ amino acid sequence, provided that said portion is at least 10 amino acids~~ selected from the group consisting of SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and

SEQ ID NO: 15, provided that said portion is at least 10 amino acids in length;

d) an optionally present linker joined to the carboxy terminus of said intracellular domain; and

e) a G-protein joined either to said intracellular domain or to said optionally present linker, provided that said G-protein is joined to said optionally present linker when said optionally present linker is present, wherein said G-protein interconverts between a GDP bound and a GTP bound form,

wherein said domains are functionally coupled such that a signal from the binding of a ligand is transduced to the intracellular domain when said G-protein fusion receptor is present in a suitable host cell, and wherein said intracellular domain when present in a wild type receptor does not interact with said G-protein.

2. (Canceled)

3. (Currently Amended) The G-protein fusion receptor of ~~claim 2~~ claim 1, wherein said optionally present linker is present and is a polypeptide 3 amino acids to 30 amino acids in length.

4. (Currently Amended) The G-protein fusion receptor of ~~claim 2~~ claim 1, wherein said optionally present linker is not present.

5. (Previously Presented) The G-protein fusion receptor of claim 3, wherein said G-protein is selected from the group consisting of: $G\alpha_{15}$, $G\alpha_{16}$, Gqo5, and Gqi5.

6. (Canceled)

7. (Currently Amended) A nucleic acid comprising a nucleotide sequence encoding for the G-protein fusion receptor of any one of ~~claims 1-6, 42, or 43~~ claims 1, 3-5, or 42.

8. (Currently Amended) An expression vector comprising a nucleotide sequence encoding for the G-protein fusion receptor of any one of ~~claims 1-6, 42, or 43~~ claims 1, 3-5, or 42 transcriptionally coupled to a promoter.

9. (Previously Presented) A recombinant cell comprising the expression vector of claim 8 and a cell wherein the G-protein fusion receptor is expressed and is functional.

10. (Previously Presented) A recombinant cell produced by combining an expression vector of claim 8, wherein said expression vector comprises the nucleic acid of claim 7 and elements for introducing heterologous nucleic acid into a cell wherein the G-protein fusion receptor is expressed, and said cell.

11. (Currently Amended) A process for the production of a G-protein fusion receptor comprising:

growing procaryotic or eukaryotic host cells comprising a nucleic acid sequence expressing the G-protein fusion receptor of any one of ~~claims 1-6, 42, or 43~~ claims 1, 3-5, or 42, under suitable nutrient conditions allowing for cell growth.

12-41. (Canceled)

42. (Previously Presented) The G-protein fusion receptor of claim 4, wherein said G-protein is selected from the group consisting of $G\alpha_{15}$, $G\ \alpha_{16}$, Gqo5, and Gqi5.

43-47. (Canceled)

48. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 2 mGluR.

49. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 3 mGluR.

50. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 4 mGluR.

51. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 6 mGluR.

52. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 7 mGluR.

53. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a Type 8 mGluR.

54. (Currently Amended) The G-protein fusion receptor of ~~claim 47~~ claim 1, wherein said extracellular domain and said transmembrane domain are from a $GABA_BR$.

55. (Previously Presented) The G-protein fusion receptor of claim 1, wherein said G-protein is a chimeric G-protein.

56-62. (Canceled)

63. (New) The G-protein fusion receptor of claim 1, wherein said extracellular domain comprises SEQ ID NO: 1, said transmembrane domain comprises SEQ ID NO: 6, and said intracellular domain comprises SEQ ID NO: 11.

64. (New) The G-protein fusion receptor of claim 1, wherein said extracellular domain comprises SEQ ID NO: 5, said transmembrane domain comprises SEQ ID NO: 10, and said intracellular domain comprises SEQ ID NO: 15.

65. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phCaR/hmGluR2*Gqi5.

66. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises pmGluR2//CaR*$G\alpha_q$i5.

67. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phmGluR2//CaR*AAA*$G\alpha_q$i5.

68. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises hGABA$_B$R2*AAA*$G\alpha_q$o5.

69. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises hGABA$_B$R1a*AAA*$G\alpha_q$o5.

70. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises phmGluR8//CaR*AAA*$G\alpha_q$i5.

71. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises pmGluR8//CaR*$G\alpha_q$i5.

72. (New) The G-protein fusion receptor of claim 1, wherein the G-protein fusion receptor comprises ph8SPmGluR4//CaR*AAA*$G\alpha_q$i5.